

Claims

1. A mask blank, which is an original plate for manufacturing a transfer mask, having on a substrate main surface a thin film, on which a transfer pattern is formed when the transfer mask is manufactured, and a resist film, which is used when the transfer mask is manufactured, comprising on a peripheral edge of the substrate main surface:

an auxiliary pattern forming region which is formed on the transfer mask, when the transfer mask is manufactured by the mask blank; and

a supported region of the mask blank, which is a region to be supported by a substrate holding member of an exposure device when a transfer is carried out by using the transfer mask,

the supported region of the mask blank further comprising:

a region where no resist film is formed,

wherein the region where no resist film is formed is the region selected in a range in which the transfer mask is held with a desired positional accuracy of the transfer pattern and a desired focus accuracy, when the transfer is performed by supporting the transfer mask manufactured by the mask blank, by the substrate holding member of the exposure device.

2. The mask blank according to claim 1, wherein the thin film and the resist film are formed in the auxiliary pattern forming region.

3. A mask blank, which is an original plate for manufacturing a transfer mask, having on a substrate main surface a thin film, on which a transfer pattern is formed when the transfer mask is manufactured, and a resist film, which is used when the transfer mask is manufactured, comprising on a peripheral edge of the substrate main surface:

an auxiliary pattern forming region which is formed on the transfer mask, when the transfer mask is manufactured by the mask blank; and

a supported region of the mask blank, which is a region to be supported by a substrate holding member of an exposure device when a transfer is carried out by using the transfer mask,

wherein the supported region of the mask blank includes a region where the resist film is not exposed to light, and the region where the resist film is not exposed to light is the region from which the resist film is removed when the resist film is developed, and the region from which the resist film is removed is the region selected in a range in which the transfer mask is held with a desired positional accuracy of the transfer pattern and a desired focus accuracy, when the transfer is performed by supporting the transfer mask manufactured by the mask blank, with the resist film removed, by the substrate holding member of the transfer device.

4. The photomask blank according to claim 3, wherein the auxiliary pattern forming region is the non-exposure region which is not exposed to light.

5. A manufacturing method of a mask blank, which is an original plate for manufacturing a transfer mask, comprising:

a thin film forming process for forming a thin film on a substrate main surface, on which a transfer pattern is formed when the transfer mask is manufactured;

a resist coating process for applying a positive resist on the thin film; and

a thermal treatment process for thermally treating the resist thus applied,

wherein a mask blank comprises on a peripheral edge of the substrate main surface:

an auxiliary pattern forming region which is formed on the transfer mask, when the transfer mask is manufactured by the mask blank; and

a supported region of the mask blank, which is a region supported by a substrate holding member of an exposure device when a transfer is carried out by using the transfer mask,

wherein the supported region of the mask blank includes a region where the resist film is not exposed to light, and the region where the resist film is not exposed to light is the region from which the resist film is removed when the resist film is developed, and the region where the resist film is removed

is the region selected in a range in which the transfer mask is held with a desired positional accuracy of the transfer pattern and a desired focus accuracy, when the transfer is performed by supporting the transfer mask manufactured by the mask blank, by the substrate holding member of the transfer device, with the resist film removed.

6. The manufacturing method of the mask blank according to claim 5, comprising:

an exposure process of an unnecessary resist film formed on the peripheral edge of the substrate main surface; and

a resist film removing process for removing the unnecessary resist film formed on the peripheral edge of the substrate main surface and the resist film formed in the supported region, by selectively supplying a developing solution to the exposure region after the exposure process.

7. A manufacturing method of a transfer mask for jointly removing the thin film formed in the supported region already exposed to light during formation of a transfer pattern, in an etching processing step in the transfer mask manufacturing step where the maskblank obtained by the manufacturing method of the mask blank according to claim 5 is used.

8. A manufacturing method of a transfer mask for manufacturing the transfer mask by using a mask blank formed

with a thin film on which a transfer pattern is formed on a substrate main surface and a positive resist film formed on the thin film, thereby forming a pattern on the thin film, wherein the peripheral edge of the transfer mask includes a supported region, e.g. a region supported by a substrate holding member of an exposure device when transfer is performed, and the supported region further includes the region where the thin film is not formed, and the region where the thin film is not formed is the region selected in a range in which the transfer mask is held with a desired positional accuracy of the transfer pattern and a desired focus accuracy, when the transfer is performed by supporting the transfer mask by the substrate holding member of the exposure device.

9. A manufacturing method of a semiconductor device, wherein the transfer mask obtained by the manufacturing method of the transfer mask according to claim 8 is used to form a pattern by transferring the transfer pattern on a semiconductor substrate by a lithography method.